BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
PAUL NEWMAN
SANDRA D. KENNEDY
BOB STUMP

IN THE MATTER OF THE APPLICATION OF TRICO ELECTRIC COOPERATIVE, INC., AN ARIZONA NONPROFIT CORPORATION, FOR A PERMANENT RATE INCREASE, FOR A DETERMINATION OF THE FAIR VALUE OF THE CORPORATION'S ELECTRIC SYSTEM FOR RATEMAKING PURPOSES, FOR A FINDING OF A JUST AND REASONABLE RATE OF RETURN THEREON, AND FOR APPROVAL OF RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	DOCKET NO. E-01461A-08-0430 **STAFF'S NOTICE OF FILING SUPPLEMENTAL TESTIMONY**

Staff of the Arizona Corporation Commission ("Staff") hereby files the Supplemental Testimony of J. Jeffrey Pasquinelli of the Utilities Division in the above-referenced matter.

RESPECTFULLY SUBMITTED this 19th day of June, 2009.

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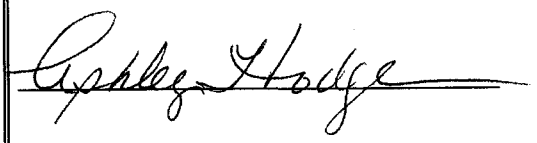

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SUPPLEMENTAL

TESTIMONY

OF

J. JEFFREY PASQUINELLI

PUBLIC UTILITIES ANALYST

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JUNE 19, 2009

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DOCKET NO. E-01461A-08-0430

Mr. Pasquinelli's testimony makes the following recommendations with respect to Trico Electric Cooperative, Inc. ("Trico" or "Co-op") Demand Side Management ("DSM") programs:

- These programs should be merged into a single Energy Audit Program:
  - Residential Energy Audits
  - C&I (Non-Residential) Energy Audits
- The Commission should then approve four of Trico's proposed DSM programs, as modified herein:
  - Energy Audits
  - Operation Cool Shade
  - Classroom Connection
  - Pima County Weatherization
- The following educational programs should be merged into the Energy Audit Program recommended by Staff:
  - Conservation Workshops
  - MSR Training

INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Jeffrey Pasquinelli. I am a Utilities Analyst employed under contract by the Arizona Corporation Commission ("ACC" or "Commission") in the Utilities Division ("Staff"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Are you the same Jeffrey Pasquinelli who filed direct testimony in this docket?

A. Yes, I am.

Q. What is the purpose of your supplemental testimony?

A. With this supplemental testimony, I will discuss my analysis of and make recommendations pertaining to Demand Side Management ("DSM") programs proposed by Trico Electric Cooperative, Inc. ("Trico").

TRICO'S DSM PROGRAMS

Q. What is Trico's DSM plan?

A. Trico describes seven DSM programs in its direct case. These programs are in operation, and are listed below on Table 1. Trico has proposed to add programs and perhaps change existing programs with a DSM portfolio filing later this year. The Co-op has not previously filed for Commission approval of its programs.

Table 1
Trico Electric Cooperative, Inc.
Existing DSM Programs

1. MSR Energy Training Workshop
2. Conservation Workshop Program
3. Classroom Connection
4. Residential Home Energy Audits
5. Non-Residential Energy Audits
6. Operation Cool Shade
7. Pima County Weatherization

Q. How are they recovering the costs of the DSM programs?

A. Trico stated in its direct case that it currently recovers its DSM Program costs through its existing revenues.

Q. How is this economic net benefit determined?

A. Established economic analysis technique requires that the costs and benefits of a project be compared on a present value basis. Net present value is the present value of benefits minus the present value of costs The Commission's 1991 Resource Planning Decision established the Societal Test as the methodology to be used for determining the cost-effectiveness of a DSM program. Under the Societal Test, the incremental benefits to society of a program must exceed the incremental cost of having the program in place on a present value basis. So in order to be cost-effective; a ratio of benefits to costs, that is, the net present value of benefits divided by the net present value of costs, must be greater than one. This is the Benefit/Cost ("B/C") ratio.

Societal costs for a DSM Program are the costs of implementation, excluding any rebates. The societal benefits of the program include deferred or avoided generation energy and capacity costs and reduced water consumption and emissions.

Q. What are the costs associated with Trico's Programs?

A. Trico has provided its costs categorized as follows.

Table 2
Trico DSM Programs Cost Categories

	Program	Admin	Marketing	Training	Material	Implement	Evaluate	Total
1	MSR Energy Auditing	7,843	1,568	5,040		60,482	2,137	78,430
2	Conservation Workshops	200	40		300	1,380	80	2,000
3	Classroom Connection	255	51		1,500	640	102	2,548
4	Residential Audits	168	34			1,407	67	1,675
5	Non-Residential Audits	500	100			4,200	200	5,000
6	Operation Cool Shade	2,208	442		3,985	14,558	883	22,075
7	Pima County Weatherization	410	82			3,444	164	4,100
	Overall	11,584	2,317	5,040	5,785	86,471	4,633	115,828

Q. What are Staff's positions with respect to Trico's DSM programs?

A. For each of Trico's DSM programs, I will provide a brief summary along with Staff's recommendations.

1. Member Service Representative ("MSR") Energy Training Workshop

Q. Please describe the MSR Energy Training Workshop.

A. The Member Service Representative Energy Training Workshop would be a seven-hour training session designed to educate Trico's MSRs in advanced energy savings techniques, thus enabling Trico to better assist members in using energy more efficiently. The MSRs would be trained to conduct telephone surveys regarding various aspects of the members' home energy usage, including: size and type of electric appliances; size and type of heating, ventilation and air conditioning; as well as daily habits. At the end

of the survey, the MSR would make recommendations to help the member use energy more efficiently, resulting in energy conservation.

Strategy and Objectives

The Energy Training Workshop's objective would be to train Trico's MSRs in advanced energy savings techniques, enabling them to better assist Trico members in using energy more efficiently. The Workshop is a required part of each MSR's job, the goal being to better educate Trico members regarding energy efficiency and conservation. Trico members are made aware that this hands-on assistance is available.

The program's objective is to not only reduce energy consumption, but also to shift energy use to off-peak hours, reduce peak demand, and to improve system efficiency, all in a cost-effective manner.

Program Implementation Schedule

The first MSR Energy Training Workshop was conducted in May 2008 and is scheduled again in May of 2009. The MSRs are currently taking calls and assisting members in the manner described in the program. Staff takes the position that this function is related to energy audits and will make recommendations accordingly.

Monitoring and Evaluation

Attempting to determine the demand and energy output of the participating households can lead to imperfect results. Therefore, Trico used study assumptions to estimate energy savings. Staff recommends that Trico establish thorough monitoring and evaluation measures, including surveys and the collection of participant data, so as to verify the program's effectiveness.

Q. What are Staff's recommendations regarding the MSR Energy Training Workshop?

A. Both Trico and Staff realize that it is difficult to measure results of educational conservation programs. Using demand and energy reductions as estimated by Trico would result in an economic analysis that was, at best, imprecise. Staff does not recommend Commission approval as a separate program at this time. Training can be valuable, however, and Staff recommends this training program be done as part of an Energy Audit Program.

2. Conservation Workshop Program

Q. Please describe the Conservation Workshop Program.

A. The Conservation Workshop Program would help homeowners learn energy conservation techniques. Trico representatives would meet with homeowners associations, apartment complex residents, or any community group that wishes to hold a workshop. Attendees learn ways to conserve energy, as well as how to select and purchase energy efficient appliances. Home Energy Savings Guides are distributed to all participants.

Eligibility and Target Market

Although targeted to Trico's residential members, anyone in the community could attend a Conservation Workshop and learn ways to conserve energy.

Strategy and Objectives

By teaching homeowners ways to conserve energy in their homes, the expectation is to shift peak energy use to off-peak hours, reduce peak demand, improve system efficiency, reduce energy consumption in a cost-effective manner, and to reduce the need for future generation.

Monitoring and Evaluation

Trico proposes to evaluate the impacts and gauge the effectiveness of its DSM programs through a variety of methods.

The Co-op realizes that monitoring the demand and energy use of the participating households can lead to imperfect results. Staff recommends that Trico establish thorough monitoring and evaluation measures, including surveys and the collection of participant data, so as to verify the program's effects.

Q. What is Staff's recommendation regarding the Conservation Workshop Program?

A. Both Trico and Staff realize that it is difficult to measure results of educational conservation programs. Using demand and energy reductions as estimated by Trico would result in an economic analysis that was, at best, imprecise. Staff does not recommend Commission approval as a separate program at this time. As with the MSR Energy Training Workshop, Staff recommends that the Conservation Workshop Program be done as part of the Energy Audit program.

3. Classroom Connection Program

Q. Please describe the Classroom Connection program.

A. The Classroom Connection program would educate elementary school students on the overall concept of conserving energy as well as methods they themselves can use to conserve in their own homes. Trico representatives visit schools in Trico's service area and conduct hands-on classroom lessons including informational activity booklets which are distributed to all students.

Eligibility and Target Market

Elementary schoolchildren in Trico's service area are the target market for the Classroom Connection program.

Strategy and Objectives

The program's objective is to teach children how to conserve energy in their homes, and provide information that could be shared with their household. This would result in reduced energy consumption, shifting of energy use to off-peak hours, reduction of peak demand, improvement of system efficiency, and a reduction of the need for future generation.

Monitoring and Evaluation

Trico realizes that it is difficult to measure results of energy conservation programs such as Classroom Connection. Families may or may not be influenced by students' classes, and may implement some, all, or none of the measures that the student learned. In addition, there are many practical factors such as household size, appliance variations, and lifestyle to be accounted for; therefore, Trico would use assumptions to estimate the savings realized from the Classroom Connection program.

School education programs lead to energy savings if students are able to influence their households to take the energy-conserving actions they were taught. To determine the proportion of students that influence their families, Trico used conservatively modified data from a case study of a recycling education program in a Toronto, Ontario, elementary school and from an Oak Ridge National Laboratory study.

Q. What is Staff's recommendation regarding the Classroom Connection Program?

A. As stated previously, Staff and Trico realize that it is difficult to measure results of educational conservation programs because the goal of these programs is to change behavior making it difficult to objectively measure energy savings or cost effectiveness. Staff's position is that while standard economic analysis may not be appropriate for educational or market transformation programs, such programs' effectiveness must still be determined. Staff recommends that Trico establish thorough monitoring and evaluation measures, including surveys and the collection of participant data, so as to verify the program's effects.

Parents of students should be surveyed to determine whether their child's participation in the Classroom Connection Program resulted in any action to improve energy efficiency. Data concerning schools, teachers, and students should be collected, as well as comments from participants.

4. Residential Home Energy Audits

Q. Please describe the Residential Home Energy Audits.

A. The Residential Home Energy Audits help Trico members identify where their homes use the most energy and then educate them on methods to reduce energy consumption. First, Trico MSRs help the member conduct a "self-audit" via the telephone. If a member has concerns after the self-audit and has discussed energy-use patterns with the MSR, a Trico representative can be scheduled to conduct an on-site energy audit, which includes an analysis of the thermal envelope, an electric appliance survey and a review of living habits. The auditor then makes recommendations that will result in a more energy efficient home.

Eligibility and Target Market

The target market for the Residential Home Energy Audits program is the residential member, and all Trico residential customers are eligible to receive a home energy audit.

Strategy and Objectives

The objective of the Residential Home Energy Audits is to assist members in managing home energy use. Proper energy management can save customers money, shift peak energy load to off-peak hours, reduce peak demand, improve system efficiency, reduce energy consumption in a cost-effective manner, and also reduce the need for future generation.

Residential Home Energy Audits are promoted and communicated to members on Trico's web site by the MSRs and in the Livewire newsletter.

The Residential Home Energy Audit Program is administered by the Trico Member Services and Marketing Staff. The actual on-site audit is conducted by a Trico representative. Trico MSRs will track Home Energy Audits in Trico's database so that the Co-op may track the program's effectiveness.

Program Implementation Schedule

Trico MSRs and auditors are currently taking calls and assisting members in the manner described.

Monitoring and Evaluation

The method of estimating the savings the residential retrofits would be derived from recent, relevant studies. An adjustment factor is applied based on a conservative assumption that only half of the recommended measures would be used.

Trico would intend to monitor demand and energy savings, as well as monitor and evaluate programs for cost effectiveness, member participation, and societal benefit using the following method:

- Create a data base of program participants.
- Compare the program participant's historical energy use data for a one year prior billing period to the year following the energy audit to establish the difference.
- When available, compare historical demand use data for comparison of savings after the energy audit for determining peak demand reduction.
- Calculate cost effectiveness and societal benefit for the result of the comparison of before and after the audit determining the number of participants who actually implemented the recommended measures.

Staff Recommendation

Q. What is Staff's recommendation regarding the Residential Home Audits Program?

A. Staff recommends that the Residential and Non-Residential Home Energy Audits Programs be consolidated into one Energy Audit Program and be approved with the conditions indicated below following discussion of the Non-Residential Home Energy Audits Program.

5. Non-Residential Energy Audit Program

Q. Please describe the Non-Residential Energy Audit Program.

A. Non-Residential Energy Audits are performed upon request for commercial and industrial ("C&I") customers. A site survey, load profile analysis, and review of historical usage are used to identify energy consumption. This information is compiled in a comprehensive report, which is evaluated with the member. The report makes recommendations in the areas of technology and best practices to help improve the energy efficiency of operations.

Eligibility and Target Market

Commercial and Industrial customers are the target market for the Non-Residential Energy Audits. All Trico Commercial and Industrial customers are eligible for Non-Residential Energy Audits.

Strategy and Objectives

Trico utilizes face-to-face contacts, community meetings, and the Trico web site to promote Non-Residential Energy Audits.

The Non-Residential Energy Audits' objective is to recommend to C&I customers technology and best practices that will improve the energy efficiency of electric equipment at the facility. This could include replacing inefficient equipment and improving the building envelope. The goal is to reduce peak demand and peak period energy use, improve system efficiency, and reduce the need for additional generation resources. All this would be done in a cost-effective manner. Administration and delivery of the Non-Residential Energy Audits program is the responsibility of the Marketing Staff Key

Accounts group. The Staff tracks all on-site audits, including suggestions made to the member.

Monitoring and Evaluation

Trico's method of initially estimating the savings from non-residential audits is derived from an Oak Ridge National Laboratory evaluation from June 2005. An adjustment factor was applied based on the conservative assumption that only half of the recommended measures would be installed. This yielded an average savings of 22.23 kW per audited project.

Trico intends to monitor demand and energy savings, as well as monitor and evaluate programs for cost effectiveness, member participation, and societal benefit using the following method:

- Create a data base of program participants.
- Compare the program participant's historical energy use data for a one-year prior billing period to the year following the energy audit to establish the difference.
- When available, compare historical demand use data for comparison of savings after the energy audit for determining peak demand reduction.
- Calculate cost effectiveness for the result of the comparison of before and after the audit determining the number of participants who actually implemented the recommended measures.

Staff Recommendation

Q. What is Staff's recommendation regarding the Non-Residential Home Audits Program?

A. Staff recommends that the Non-Residential Energy Audits and the Residential Home Energy Audits Programs be consolidated into one Energy Audit Program, and be

approved with the conditions indicated below. By consolidating the two energy audit programs into one program, there can be administrative cost savings to Trico.

Q. What are the conditions you referred to in recommending approval of the two energy audit programs?

A. First, the two educational programs discussed above, Conservation Workshops and MSR Training, should be incorporated as parts of the Energy Audit Program.

Similar to educational programs, the claimed results of energy audits might be imprecise. Energy saving can be subjective if the savings involve lifestyle or operational change recommendations. Comprehensive monitoring and evaluation must be employed.

To be sure that DSM and conservation funds are well spent, Staff recommends that the Commission approve the Energy Audit program as a two-year pilot program. Trico has stated that they intend to institute a relatively thorough monitoring and evaluate procedure, and with that information the Commission can decide whether or not to continue the program after the two-year period.

At the end of the two-year period, Trico would submit an all-inclusive report detailing the results of its energy audits. For each member - residential, commercial, or industrial - Trico would show:

- type of customer
- connected load
- appliance and equipment survey
- monthly demand and energy use for twelve months prior to survey
- survey recommendations made
- recommendations put into practice
- customer's expense to implement energy saving measures
- monthly demand and energy use for twelve months following implementation

If collecting the required data for each audited member is overly burdensome, Trico would conduct a statistically significant sample of customers.

6. Operation Cool Shade Tree-Planting Program

Q. Please describe the Operation Cool Shade Program.

A. The Operation Cool Shade program promotes energy conservation through the planting of low-water use shade trees. By planting trees in key locations around a home or business, customers can see savings on their summer cooling bills.

Trico would purchase desert-adapted trees from local growers and offer them to members at discounted prices. In partnership with the Pima County Master Gardeners, Trico also offers several tree planting classes at various locations to help members select the optimum location for their trees for energy conservation. The classes also teach them how to best care for the trees. (Members that attend the class receive a further discount on their trees.)

When the trees mature, they reduce overall energy consumption. Each year, Trico distributes 1,200 to 1,500 trees. Since its inception more than 10 years ago, the program has provided more than 10,000 trees to Trico members.

The target market for the Operation Cool Shade program is the residential member. However, all Trico customers are eligible to participate.

Strategy and Objectives

The Operation Cool Shade objective would promote energy conservation through the planting of low-water use shade trees. The objective is to reduce the individual

member's electric bill, shift peak energy load to off-peak hours, reduce peak demand, improve system efficiency, reduce energy consumption in a cost-effective manner, and, finally, reduce the need for future generation. Operation Cool Shade is administered and delivered by the Trico Communication Staff and the Pima County Master Gardeners. The Communications Staff tracks the program via applications and an applicant database, enabling Trico to track the program's effectiveness.

Program Implementation Schedule

Beginning in late spring, Trico would promote the Operation Cool Shade program to residential members via the Livewire newsletter, the web site, and the Back of the Bill. Throughout the year, the program is promoted via the Trico web site and at Conversation Workshops, the Annual Meeting, and other group events. The Operation Cool Shade program would be put into operation every year. The schedule would begin with sign-ups in June, followed by tree care classes in the fall. Tree pick-up day would be scheduled for early November.

Monitoring and Evaluation

Trico would use the American Public Power Association ("APPA") Tree Benefit Estimator to quantify and track the benefits of planting shade trees. The Tree Benefit Estimator estimates the amount of energy and demand savings and carbon and CO_2 sequestration resulting from mature trees planted in urban and suburban settings. The Estimator takes into consideration the following criteria;

- trees' species
- direction the tree faces (for trees planted next to buildings)
- distance between the tree and the building that is being shaded
- age of the tree from the tree planting date
- climate zone

However, broad assumptions have been made regarding trees' impact on direct shading benefits, impacts of indirect or evapotranspiration effect, heating penalty in winter months, tree growth rates and tree survival rates. As a result, this method may yield less precise results than a more tailored approach and to verify the Program's effects, Staff is recommending reporting of each participant's monthly demand and energy use for a one-year period before and after the tree planting .

Staff Recommendation

Q. What are Staff's recommendations regarding the Operation Cool Shade Program?

A. Staff's analysis of the Operation Cool Shade program shows a B/C ratio of 2.9, indicating that the benefits are greater than the costs. Staff's analysis does not include the benefits of reduced environmental effects. Were these societal benefits quantified and incorporated into Staff's analysis, an even greater B/C ratio would result. Staff recommends that the Trico Cool Shade Tree Program be approved, with the following conditions:

The program provides participants with information emphasizing the energy savings that result from planting trees to shade buildings.

The trees' species must be appropriate for the area.

- The direction the tree faces must be appropriate for shading of buildings.
- The distance between the tree and the building that is being shaded must be appropriate for maximum benefit.
- South wall plantings must be deciduous trees to allow for winter heating effects.
- Information must be made available to homeowners about safely pruning trees to decrease winter shading.

- Program participants must be provided with information regarding tree maintenance and the removal of ground level debris, shrubs or grasses to reduce fire danger.

- Members are provided up to 4 trees per home or business if it can be determined that there are enough resources to provide the additional trees without creating a shortage for other participants.

- The monitoring and evaluation process include, but not necessarily be limited to, the development of data concerning tree maintenance costs, tree mortality and kW/kWh savings.

- The program is reported in the Company's DSM reports to the Commission. At a minimum, reporting should include the following information:

  a) Customer participation levels;

  b) Amount spent during the reporting period and, in the end-of-year report, the amount spent during the course of the calendar year;

  c) Results of the monitoring and evaluation process, including tree maintenance costs, tree mortality, and growth rates;

  d) A comparison of each program participant's monthly demand (if available) and energy use for a one-year period prior to the tree planting to a year following the tree planting;

  e) Estimated environmental savings;

  f) Issues that may concern the Co-op regarding the program, along with plans to address any problems; and

  g) Any major changes planned regarding the program, including termination of the program itself.

7. Pima County Weatherization

Q. Please describe the Pima County Weatherization program.

A. Offered by Pima County, this program assists low-income residents in reducing energy use and lowering utility bills through the implementation of year-round weatherization methods. This program would be provided at no cost to eligible Trico customers.

Trico provided $4,100 in funding to this program to improve the energy efficiency of qualifying homes located in Trico's service area.

Eligibility and Target Market

This program is targeted to low-income residential customers living in Trico's service area. Applicants must first contact Pima County for an application and demonstrate that their household income is less than 150 percent of the federal poverty level. Program participation is subject to funding availability.

Strategy and Objectives

The Pima County Weatherization program objective is to improve the energy efficiency of qualifying homes in the Trico service area, shift peak energy load to off-peak hours, reduce peak demand ("kW"), improve system efficiency, reduce energy consumption ("kWh") in a cost-effective manner, and reduce the need for future generation.

Program Implementation Schedule

The Pima County Weatherization Program Implementation Schedule will commence upon the Commission's approval of the DSM portfolio.

Monitoring and Evaluation

Primary energy savings per house from residential retrofits for the Tucson area are estimated from data provided by Charlie Gohman, Arizona Energy Office, Phoenix, Arizona. These savings estimates were for actions that are implemented by the Weatherization Assistance Program ("WAP") in the Tucson area by the Pima County Weatherization program. The retrofitted homes saved an average of 1067 kWh per year.

Trico intends to monitor demand and energy savings, as well as monitor and evaluate the program for cost effectiveness, member participation, and societal benefit using the following method:

- Create a data base of program participants.
- Compare the program participant's historical energy use data for a one-year prior billing period to the year following the weatherization of the home.
- When available, compare historical demand use data for comparison of savings after the weatherization of the home for determining peak demand reduction.
- Calculate cost effectiveness and societal benefit after the weatherization of the home.

Staff Recommendation

Staff's analysis of the Pima County Weatherization program shows a B/C ratio of 0.97, indicating that the benefits are nearly equal to the costs. Staff's analysis does not include the benefits of reduced environmental effects. Were these societal benefits quantified and incorporated into Staff's analysis, a B/C ratio greater than one would unquestionably result. Staff recommends approval of the Pima County Weatherization program.

Q. Please review Staff's Recommendations for Trico's DSM program proposal.

A. Table 3 below summarized Staff's recommendations for each program. Further recommendations follow.

Table 3
Trico Electric Cooperative, Inc.
DSM Programs
Staff Recommendations

PROGRAM	RECOMMENDATION
1. MSR Energy Training Workshop	Merge with Energy Audits
2. Conservation Workshop Program	Merge with Energy Audits
3. Classroom Connection	Approve
4. Residential Home Energy Audits	Merge with Energy Audits
5. Non-Residential Energy Audits	Merge with Energy Audits
6. Operation Cool Shade	Approve
7. Pima County Weatherization	Approve
8. Consolidated Energy Audits Program	Approve

Q. What are Staff's further recommendations?

A. Further recommendations are that Trico should file a semi-annual report with the Commission that includes detailed analysis and results of each approved DSM program. For each program, Trico should report, minimally:

- The number of program participants;
- The types of customers;
- Customer's connected load;
- An appliance and equipment inventory;
- The monthly demand and energy use for twelve months prior to implementation of the DSM measure;
- Recommendations made;
- The recommendations put into practice;
- The monthly demand and energy use for twelve months following implementation;

- Trico's expense to implement the program; and

- Customer's expense to implement energy saving measures

Additionally, Staff sees no discussion of a Compact Fluorescent Lamp ("CFL") program in Trico's direct case. Staff's experience is that CFLs are among the most cost-effective methodologies for conservation or DSM. Staff recommends that Trico begin study and analysis to add a CFL program to its DSM portfolio.

Q. Does this complete your supplemental testimony?

A. Yes, it does.